

GE23131-Programming Using C-2024

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Status	Finished
Started	Wednesday, 15 January 2025, 10:40 AM
Completed	Wednesday, 15 January 2025, 11:16 AM
Duration	35 mins 42 secs

Question 1

Correct

Marked out of 3.00

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Given an array A of sorted integers and another non negative integer k, find if there exists 2 indices i and j such that $A[i] - A[j] = k$, $i \neq j$.

Input Format

- 1. First line is number of test cases T. Following T lines contain:
- 2. N, followed by N integers of the array
- 3. The non-negative integer k

Output format

Print 1 if such a pair exists and 0 if it doesn't.

Example

Input:

1
3 1 3 5
4

Output:

1

Input:

1
3 1 3 5
99

Output:

0

Answer: (penalty regime: 0 %)

```
1 #include<stdio.h>
2 int main()
3 {
4     int t;
5     scanf("%d",&t);
6     while(t--){
7         int n;
8         scanf("%d",&n);
9         int a[n];
10        for(int i=0;i<n;i++){
11            scanf("%d",&a[i]);
12        }
13        int k;
14        scanf("%d",&k);
15        int flag=0;
16        for(int i=0;i<n;i++){
17            for(int j=i+1;j<n;j++){
18                if(a[i]-a[j]==k || a[j]-a[i]==k){flag=1;break;}
19            }
20        }
21        if(flag) break;}
22        printf("%d\n",flag);
23    }
24 }
```

	Input	Expected	Got	
✓	1 3 1 3 5 4	1	1	✓
✓	1 3 1 3 5 99	0	0	✓

Passed all tests! ✓

Question **2**

Correct

Marked out of
5.00

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Sam loves chocolates and starts buying them on the 1st day of the year. Each day of the year, x , is numbered from 1 to Y . On days when x is odd, Sam will buy x chocolates; on days when x is even, Sam will not purchase any chocolates.

Complete the code in the editor so that for each day N_i (where $1 \leq x \leq N \leq Y$) in array `arr`, the number of chocolates Sam purchased (during days 1 through N) is printed on a new line. This is a function-only challenge, so input is handled for you by the locked stub code in the editor.

Input Format

The program takes an array of integers as a parameter.

The locked code in the editor handles reading the following input from `stdin`, assembling it into an array of integers (`arr`), and calling `calculate(arr)`.

The first line of input contains an integer, T (the number of test cases). Each line i of the T subsequent lines describes the i th test case as an integer, N_i (the number of days).

Constraints

$$1 \leq T \leq 2 \times 10^5$$

$$1 \leq N \leq 2 \times 10^6$$

$$1 \leq x \leq N \leq Y$$

Output Format

For each test case, T_i in `arr`, your `calculate` method should print the total number of chocolates Sam purchased by day N_i on a new line.

Sample Input 0

3

1

2

3

Sample Output 0

1
1
4

Explanation

Test Case 0: N = 1

Sam buys 1 chocolate on day 1, giving us a total of 1 chocolate. Thus, we print 1 on a new line.

Test Case 1: N = 2

Sam buys 1 chocolate on day 1 and 0 on day 2. This gives us a total of 1 chocolate. Thus, we print 1 on a new line.

Test Case 2: N = 3

Sam buys 1 chocolate on day 1, 0 on day 2, and 3 on day 3. This gives us a total of 4 chocolates. Thus, we print 4 on a new line.

Answer: (penalty regime: 0 %)

```
1 #include<stdio.h>
2 int main()
3 {
4     int t;
5     scanf("%d",&t);
6     while(t--){
7         int n,c=0;
8         scanf("%d",&n);
9         for(int i=0;i<=n;i++){
10             if(i%2!=0) c=c+i;
11         }printf("%d\n",c);
12     }
13 }
```

	Input	Expected	Got	
✓	3 1 2 3	1 1 4	1 1 4	✓
✓	10 71 100 86 54 40 9 77 9 13 98	1296 2500 1849 729 400 25 1521 25 49 2401	1296 2500 1849 729 400 25 1521 25 49 2401	✓

Passed all tests! ✓

Question **3**

Correct

Marked out of
7.00

🚩 Flag question

The number of goals achieved by two football teams in matches in a league is given in the form of two lists. Consider:

- Football team A, has played three matches, and has scored { 1 , 2 , 3 } goals in each match respectively.
- Football team B, has played two matches, and has scored { 2 , 4 } goals in each match respectively.
- Your task is to compute, for each match of team B, the total number of matches of team A, where team A has scored less than or equal to the number of goals scored by team B in that match.
- In the above case:
 - For 2 goals scored by team B in its first match, team A has 2 matches with scores 1 and 2.
 - For 4 goals scored by team B in its second match, team A has 3 matches with scores 1, 2 and 3.

Hence, the answer: {2, 3}.

Complete the code in the editor below. The program must return an array of m positive integers, one for each maxes[i] representing the total number of elements nums[j] satisfying $\text{nums}[j] \leq \text{maxes}[i]$ where $0 \leq j < n$ and $0 \leq i < m$, in the given order.

It has the following:

nums[nums[0],...,nums[n-1]]: first array of positive integers

maxes[maxes[0],...,maxes[m-1]]: second array of positive integers

Constraints

- $2 \leq n, m \leq 105$
- $1 \leq \text{nums}[j] \leq 109$, where $0 \leq j < n$.
- $1 \leq \text{maxes}[i] \leq 109$, where $0 \leq i < m$.

Input Format For Custom Testing

Input from stdin will be processed as follows and passed to the function.

The first line contains an integer n , the number of elements in `nums`.

The next n lines each contain an integer describing `nums[j]` where $0 \leq j < n$.

The next line contains an integer m , the number of elements in `maxes`.

The next m lines each contain an integer describing `maxes[i]` where $0 \leq i < m$.

Sample Case 0

Sample Input 0

```
4
1
4
2
4
2
3
5
```

Sample Output 0

```
2
4
```

Explanation 0

We are given $n = 4$, $\text{nums} = [1, 4, 2, 4]$, $m = 2$, and $\text{maxes} = [3, 5]$.

1. For $\text{maxes}[0] = 3$, we have 2 elements in nums ($\text{nums}[0] = 1$ and $\text{nums}[2] = 2$) that are $\leq \text{maxes}[0]$.
2. For $\text{maxes}[1] = 5$, we have 4 elements in nums ($\text{nums}[0] = 1$, $\text{nums}[1] = 4$, $\text{nums}[2] = 2$, and $\text{nums}[3] = 4$) that are $\leq \text{maxes}[1]$.

Thus, the function returns the array $[2, 4]$ as the answer.

Sample Case 1

Sample Input 1

5
2
10
5
4
8
4
3
1
7
8

Sample Output 1

1
0
3
4

Explanation 1

We are given, $n = 5$, $\text{nums} = [2, 10, 5, 4, 8]$, $m = 4$, and $\text{maxes} = [3, 1, 7, 8]$.

1. For $\text{maxes}[0] = 3$, we have 1 element in nums ($\text{nums}[0] = 2$) that is $\leq \text{maxes}[0]$.

1. For `maxes[0] = 3`, we have 1 element in `nums` (`nums[0] = 2`) that is \leq `maxes[0]`.
2. For `maxes[1] = 1`, there are 0 elements in `nums` that are \leq `maxes[1]`.
3. For `maxes[2] = 7`, we have 3 elements in `nums` (`nums[0] = 2`, `nums[2] = 5`, and `nums[3] = 4`) that are \leq `maxes[2]`.
4. For `maxes[3] = 8`, we have 4 elements in `nums` (`nums[0] = 2`, `nums[2] = 5`, `nums[3] = 4`, and `nums[4] = 8`) that are \leq `maxes[3]`.

Thus, the function returns the array `[1, 0, 3, 4]` as the answer.

Answer: (penalty regime: 0 %)

```

1  #include<stdio.h>
2  int main(){
3      int s1,s2,ans;
4      scanf("%d",&s1);
5      int ta[s1];
6      for(int i=0;i<s1;i++){
7          scanf("%d",&ta[i]);
8      }
9      int tb[s2];
10     for(int i=0;i<s2;i++){
11         scanf("%d",&tb[i]);
12     }
13     ans=0;
14     for(int i=0;i<s1;i++){
15         if(tb[i]>=ta[i])
16             ans++;
17     }
18     printf("%d\n",ans);
19 }
20

```

	Input	Expected	Got	
✓	4 1 4 2 4 2 3 5	2 4	2 4	✓
✓	5 2 10 5 4 8	1 0 3 4	1 0 3 4	✓

	4			
	3			
	1			
	7			
	8			

Passed all tests! ✓

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